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DOECGF 2008 Site Report

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Disclaimer

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DOECGF 2008 Site Report:

Lawrence Livermore National Laboratory

Site Name:

Lawrence Livermore National Laboratory

Site Division or Group:

Computation: Data Group, Information Management and Graphics Group, CASC

Site Representative:

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Mission:

The Data group provides data analysis and visualization support to its customers. This consists primarily of the development and support of VisIt, a data analysis and visualization tool. Support ranges from answering questions about the tool, providing classes on how to use the tool, and performing data analysis and visualization for customers.

The Information Management and Graphics Group supports and develops tools that enhance our ability to access, display, and understand large, complex data sets. Activities include applying visualization software for terascale data exploration; running two video production labs; supporting graphics libraries and tools for end users; maintaining PowerWalls and assorted other displays; and developing software for searching, managing, and browsing scientific data.

Researchers in the Center for Applied Scientific Computing (CASC) work on various projects including the development of visualization techniques for terascale data exploration that are funded by the ASC program, among others. The researchers also have LDRD projects and collaborations with other lab researchers, academia, and industry.

Past Year's Activities:

We have completed our visualization cluster strategy of converting to Opteron/IB clusters. We support a 128-node Opteron/IB cluster providing a visualization production server for our unclassified systems and a 256-node Opteron/IB cluster for the classified systems, as well as several smaller clusters to drive the PowerWalls. We are in the

process of updating projectors for one of the PowerWalls and acquiring new fiber modems for another. We deployed a 150 TB NFS server to provide dedicated storage for data analysis and visualization for our unclassified visualization server.

The IMG group is located in the Terascale Simulation Facility, home to BGL, Purple, and Atlas, which includes both classified and unclassified visualization theaters, a visualization computer floor and deployment workshop, and video production labs. We continued to provide the traditional graphics group consulting and video production support. We maintained five PowerWalls and a host of other displays.

The ASC projects have delivered new versions of visualization and scientific data management tools to end users and continue to refine them. VisIt had 6 releases during the past year, ending with VisIt 1.9. We had the first production releases of Hopper 2.0, a Java application for managing and transferring files. The first public OpenSource release is imminent.

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Deleted: We released version 2.0 of Hopper, a Java application for managing and transferring files. This was a major release that included a new client server architecture.

We continue to use and develop Blockbuster and Telepath. Both the VisIt and IMG teams were engaged in a variety of movie production efforts during the past year in addition to the development tasks.

Information on these tools and efforts can be found on our PPPE web pages https://computation.llnl.gov/icc/sdd/img/ and at the VisIt site: https://visit.llnl.gov.

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Plans and Priorities:

During the current fiscal year we will remain in maintenance mode with no scheduled technology refreshes for the visualization clusters. We have no major purchases planned for the following year.

We will release new versions of the various in-house tools we support. We will continue to provide consulting and support services in graphics and video production.

Research into visualization techniques continues, although funded largely by sources other than the ASC program. The visualization researchers will host a number of summer students working on a range of topics.

Funding Source:

The IMG Group is funded by ASC as well as other "institutional" sources.

CASC is funded by LDRD, ASC, and outside sponsors.

The Data group is funded by ASC, SciDAC, GNEP, and other outside sponsors.

Current Hardware Platforms:

Compute servers: See http://www.llnl.gov/computing/hpc/resources/ for details on the compute servers and storage systems.

Production visualization servers: We have one unclassified and one classified production visualization server, 3 classified PowerWalls with dedicated clusters to drive them, and 2 unclassified PowerWalls with dedicated clusters to drive them.

Gauss Linux production cluster:
256 nodes (Dual 2.4 GHz Opteron, 12GB RAM), InfiniBand, nVidia Quadro 4500, shared Lustre disk

Prism Linux production cluster:
128 nodes (Dual 2.4 GHz Opteron, 16GB RAM), InfiniBand, nVidia Quadro 5500, shared Lustre disk, dedicated NFS storage for data analysis and visualization

Video production: Our two labs include PCs, Macs, desktop video editors, and assorted recorders, monitors, mixers, and software packages.

Visualization developer's lab: Assorted small systems and a 15-panel display driven by multiple Linux clusters.

Desktop systems for visualization consist of diskless and diskfull Linux, Mac and Windows systems, with Linux the being the most common followed by Mac and Windows.

Current Software:

VisIt, EnSight, IDL, Tecplot, AVS, assorted other utilities and translators, and Blockbuster. SDM software includes Hopper and tools used in the Green Data Oasis.

Blockbuster: http://blockbuster.sourceforge.net/
Hopper: https://computing.llnl.gov/resources/hopper/
VisIt: https://visit.llnl.gov

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Current Staff:

In the Information Management and Graphics Group of Livermore Computing:

1.0 Visualization Development (non-ASC funding)
3.0 Scientific Data Management team, including some non-ASC funding
6.0 Systems and Services Integration team -- graphics support, displays, video production, and visualization software and hardware architecture (including a small amount of non-ASC funding and one team member from the systems division)

In the DATA group there are 7 people supporting VisIt.

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In CASC there are 6 visualization researchers and several graduate students.

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Upcoming Hardware Platforms:

None.

Upcoming Software:

Additional licenses for commercial software as needed.

Upcoming Staff:

None. We took major budgets cuts in Livermore Computing, with the development effort being eliminated aside from development efforts on the PowerWall software stack and scientific visualization support efforts.